

Appl. No. 10/530,644  
Amdt. dated June 8, 2007  
Reply to Office Action mailed January 8, 2007

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended) A method for manufacturing a glass substrate for an information recording medium manufactured by polishing the surface of a raw material glass plate, the method comprising:

performing a first polishing process with a polishing pad of a hard polisher to roughly polish the surface of the raw material glass plate to be smooth; and

a second polishing process with a polishing pad of a soft polisher to finely polish the surface of the roughly polished glass raw plate to be smoother;

~~wherein the first polishing process includes:~~

~~—— using a polishing pad made of a synthetic resin foam and sliding the polishing pad on the surface of the glass raw plate while supplying a polishing agent to roughly polish the surface;~~

~~—— performing a pad dressing process on the polishing pad in advance before being used in the first polishing process; and~~

~~—— polishing the surface of the polishing pad by sliding the polishing pad on a pad dresser including abrasive grains.~~

wherein the surface of the polishing pad of the hard polisher that contacts the raw material glass has an average undulation height, as measured by a stylus measuring instrument with a measuring wavelength of 0.25 to 1.4 mm, of 4 to 25  $\mu\text{m}$ , and a surface roughness as measured with a cut-off value of 2.5 mm, of 3 to 8  $\mu\text{m}$ .

2. (currently amended) A method for manufacturing a glass substrate for an information recording medium according to claim ~~+~~ 21, wherein the pad dressing process is performed so that the product of a load in  $\text{g/cm}^2$  applied to the polishing pad by the pad dresser and a task time in ~~minutes~~ required for the pad dressing process is 500 to 3000 minutes.

3. (currently amended) The method for manufacturing a glass substrate for an information recording medium according to claim ~~1~~ 21, wherein the pad dressing process is performed so that a polishing rate, which is a value indicating polishing amount per unit time in the first polishing process, is maintained in a predetermined range.
4. (currently amended) The method for manufacturing a glass substrate for an information recording medium according to claim 3, wherein, when the polishing rate obtained immediately after the pad dressing process is performed is used as a reference value, ~~the polishing rate is maintained between 80 and 100% of the reference value, and the pad dressing process is performed when the polishing rate is less than 80% of the reference value.~~
5. (previously presented) The method for manufacturing a glass substrate for an information recording medium according to claim 1, wherein the grit of the pad dresser is #325 to #600.
6. (currently amended) The method for manufacturing a glass substrate for an information recording medium according to claim ~~1~~ 21, wherein the pad dresser is set such that when the pad dresser is arranged on the surface of the polishing pad, the weight applied to the surface of the polishing pad per 1 cm<sup>2</sup> is between 0.5 and 2.0 g.
7. (previously presented) The method for manufacturing a glass substrate for an information recording medium according to claim 1, wherein the rough polishing of the raw material glass plate in the first polishing process is performed until the glass raw plate has an arithmetic mean roughness as measured by an atomic force microscope, of 1.0 nm or less, an undulation height as measured by a multi-functional disc interferometer with a measuring wavelength of 0.4 to 5.0 mm, of 1.0 nm or less, and a microscopic undulation height as measured by a three-dimensional surface structure analyzing microscope with a measuring wavelength of 0.2 to 1.4 mm, is 0.3 nm or less.

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8. (previously presented) The method for manufacturing a glass substrate for an information recording medium according to claim 1, wherein the first polishing process is for roughly polishing the surface of the raw material glass plate in two stages, pre-polishing and post-polishing, wherein load applied to the glass raw plate by the polishing pad in the first polishing process is greater during pre-polishing than during post-polishing.

9. (canceled)

10. (currently amended) The method for manufacturing a glass substrate for an information recording medium according to claim ~~3~~ 21, wherein when performing the pad dressing process, a load of 20 to 100 g/cm<sup>2</sup> is applied.

11. (currently amended) The method for manufacturing a glass substrate for an information recording medium according to ~~any one of claim 3~~ claim 21, wherein a task time for performing the pad dressing process is 10 to 60 minutes.

12. (previously presented) A glass substrate for an information recording medium by the manufacturing method according to claim 1, wherein:

the glass substrate has an arithmetic mean roughness as measured by an atomic force microscope, of 0.4 nm or less, an undulation height as measured by a multi-functional disc interferometer with a measuring wavelength of 0.4 to 5.0 mm, of 0.5 nm or less, and a microscopic undulation height as measured by a three-dimensional surface structure analyzing microscope with a measuring wavelength of 0.2 to 1.4 mm, of 0.15 nm or less.

13. (withdrawn) A polishing device for manufacturing a glass substrate for an information recording medium by polishing the surface of a raw material glass plate by using a polishing agent, the device comprising:

a carrier for moving the raw material glass plate about a center of axis; and

a polishing pad formed from a synthetic resin foam, and a pad dresser including abrasive grains, wherein the polishing pad slides on the raw material glass plate when moved by the carrier for roughly polishing the surface of the raw material glass plate while supplying the surface of the raw material glass plate with a polishing agent, and the pad dresser slides on the surface of the polishing pad to polish the polishing pad.

14. (withdrawn) The device for manufacturing a glass substrate for an information recording medium according to claim 13, wherein the pad dresser has a circular-plate shape, and the diameter and thickness are substantially the same as the diameter and thickness of the raw material glass plate.

15. (previously presented) The method for manufacturing a glass substrate for an information recording medium according to claim 2, wherein the pad dressing process is performed so that polishing rate, which is a value indicating polishing amount per unit time in the first polishing process, is maintained in a predetermined range.

16. (previously presented) The method for manufacturing a glass substrate for an information recording medium according to claim 15, wherein, when the polishing rate obtained immediately after the pad dressing process is performed is used as reference value, the polishing rate is maintained between 80 and 100% of the reference value, and the pad dressing process is performed when the polishing rate is less than 80% of the reference value.

17. (previously presented) The method for manufacturing a glass substrate for an information recording medium according to claim 2, wherein the grit of the pad dresser is #325 to #600.

18. (previously presented) The method for manufacturing a glass substrate for an information recording medium according to claim 2, wherein the rough polishing of the raw material glass plate in the first polishing process is performed until the glass raw plate has an arithmetic mean roughness as measured by an atomic force microscope, of 1.0 nm or less, an undulation height as measured by a multi-functional disc interferometer with a measuring wavelength 0.4 to 5.0 mm, of 1.0 nm or less, and a microscopic undulation height as measured by a three-dimensional surface structure analyzing microscope with a measuring wavelength of 0.2 to 1.4 mm, is 0.3 nm or less.

19. (previously presented) The method for manufacturing a glass substrate for an information recording medium according to claim 2, wherein the first polishing process is for roughly polishing the surface of the raw material glass plate in two stages, pre-polishing and post-polishing, wherein load applied to the glass raw plate by the polishing pad in the first polishing process is greater during pre-polishing than during post-polishing.

20. (previously presented) The method for manufacturing a glass substrate for an information recording medium according to claim 2, wherein after undergoing the pad dressing process, the surface of the polishing pad has an average undulation height as measured by a stylus measuring instrument with a measuring wavelength of 0.25 to 1.4 mm, of 4 to 25  $\mu\text{m}$ , and a surface roughness as measured with a cut-off value of 2.5 mm, of 3 to 8  $\mu\text{m}$ .

21. (new) The method for manufacturing a glass substrate for an information recording medium according to claim 1, wherein the polishing pad of the hard polisher is subjected to a pad dressing process in advance of being used in the first polishing process to polish the surface of the polishing pad by sliding the polishing pad on a pad dresser having abrasive grains.